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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/521,011

07/11/2005

Dominique Bras

Serie 5957

4858

7590

04/23/2008

Air Liquide  
Intellectual Property Department  
2700 Post Oak Blvd  
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EXAMINER

WU, IVES J

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

04/23/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/521,011	<b>Applicant(s)</b> BRAS ET AL.	
	<b>Examiner</b> IVES WU	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 12-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-14, 21 and 22 is/are rejected.
- 7) ☒ Claim(s) 15-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/11/2005</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- (1). **Claims 21- 22** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 recites the limitation "slope" in claim 16. There is insufficient antecedent basis for this limitation in the claim.

In claim 22, it recites: a) said vaporization means is located upstream of said expansion valve; and. The incomplete sentence renders an incomplete claim. It is rejected hence.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- (2). **Claim 12, 13, 14** are rejected under 35 U.S.C. 102(b) as being anticipated by Schmidtke (US05172555).

As to step a) converting liquid carbon dioxide into two-phase “gas+solid” carbon dioxide, liquid carbon dioxide to be converted with a direct expansion means in a method in **independent claim 12**, Schmidtke (US05172555) discloses device for expansion of liquefied gases (Title). When liquid carbon dioxide is used, it becomes a question of carbon dioxide snow and carbon dioxide cold gas in the case of expanded refrigerant (Col. 1, line 60-61). Located at the end of the branch line 7 are several expansion bore holes 9, through which expanded carbon dioxide expands for forming carbon dioxide snow and cold carbon dioxide gas (Col. 4, line 3-6).

As to step b) injecting a secondary gas into two-phase carbon dioxide in a method in **independent claim 12**, Schmidtke (US05172555) discloses the carbon dioxide being distributed

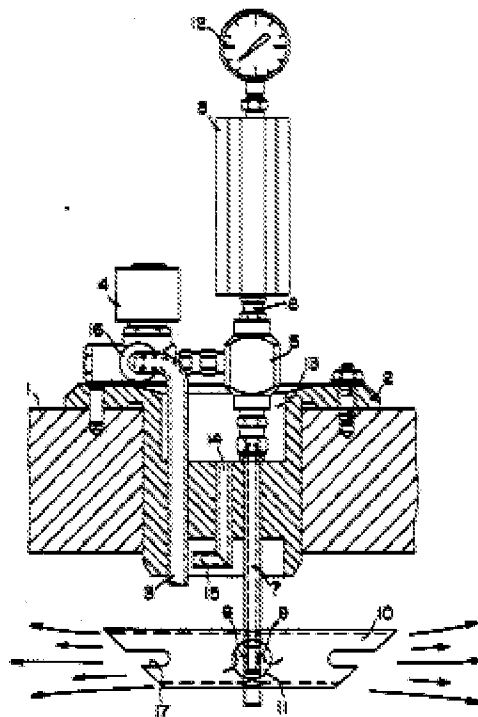
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finely in the cold gas supply pipe and mixed with the carbon dioxide cold gas as well as the aspirated secondary atmosphere (Col. 1, line 62-65). In the vicinity of the expansion bore holes 9, an ejector bore 11 is positioned in the cold gas supply pipe 10, through which secondary atmosphere is aspirated from the freezing room (Col. 4, line 8-11).

As to step c) injecting the mixture of two-phase carbon dioxide and secondary gas into a pressurized gas stream with an injector means, injector means being connected to the chamber containing stream in a method in **independent claim 12**, Schmidtke (US05172555) discloses the cold gas supply pipe 10 having on both side of its **ends** a lateral groove 17 for jet expansion of the carbon dioxide snow and cold gas stream (Col. 4, line 12-14).

As to a method which **may be** used for injecting carbon dioxide into a pressurized gaseous stream in **independent claim 12**, since it is optional, it would not be considered as patentable matter.

As to injection of two phase carbon dioxide into about the center of stream a) at least part of two-phase carbon dioxide is distributed substantially in the direction of stream flow; and b) at least part of tow-phase carbon dioxide is distributed in a direction substantially against flow in **claim 13**, as illustrated in Figure below, which illustrates the features as claimed.



As to second gas comprising gaseous carbon dioxide withdrawn from upstream of extension means in **claim 14**, Schmidtke (US05172555) discloses the device working as an aspirator which draws secondary atmosphere through the accordingly arranged ejector bore 11 in from the freezing room, finely distributes the carbon dioxide snow produced by expansion and releases it into the freezing room with the carbon dioxide gas constituent as a two-phase mixture of ca.  $-78^{\circ}\text{C}$  (Col. 4, line 48-54).it would includes the carbon dioxide withdrawn from upstream of expansion means.

***Allowable Subject Matter***

(3). **Claims 15-20** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IVES WU whose telephone number is (571)272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

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Date: April 18, 2008

/Duane S. Smith/  
Supervisory Patent Examiner, Art Unit 1797  
4-21-08